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TECHNOLOGY DEPT.

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 23, 1943

Baking Radio Tubes

See Page 264

A SCIENCE SERVICE PUBLICATION

Do You Know?

Red squill, a rat poison, is harmless to most other animals.

Aristotle the ancient Greek philosopher, advised over 2,000 years ago the eating of liver to prevent *night blindness.*

A modern 420-mile highway is nearing completion to connect Bogota, the mountain capital of Colombia, with the Pacific coast seaport Buenaventura; Bogota is 8,300 feet above sea level.

Ecuador has purchased 1,200 acres of land near Quevedo to establish an agricultural *experiment station;* the first research will be on fibers, cacao, vegetable oils, cinchona and rotenone-bearing plants.

A mixture of 14 ounces of borax, six ounces of boric acid and a gallon of water, makes a *fire-proofing* solution which may be safely used to make kitchen clothing, rugs, curtains and draperies fire-resistant.

Over *33,000,000 acres* scattered over the entire country, that can not be tilled or used for pasture or timber, could be used for wild berries, plums, cherries, grapes, currents, elderberries, hazelnuts and other wild foods.

Nylon formerly used almost wholly in clothing, is now used in paint and tooth brushes, parachute covers and shroud lines, harness straps, belting, wire insulation, window screens, and products resembling leather, sponges and cork.

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Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

Maps printed with *fluorescent ink* on special paper are used in combat areas; they can be read at night without other illumination.

Industry is producing for the Army a *map paper* which can be soaked in fresh or salt water without injury to the paper or map.

Nine war-built *aluminum* production plants owned by the government have an annual capacity of 1,200,000,000 pounds.

Cigarette paper has a new use: it is put over wounds which have been covered with sulfanilamide powder, and is said to be an improvement over gauze.

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MEDICINE

Penicillin vs. Syphilis

Expectation that both syphilis and gonorrhea may be conquered by penicillin, germ-killer from mold, results from apparent cure of four cases.

➤ FIRST NEWS that penicillin, the germ-killing chemical from a common mold, may prove the weapon that will eventually conquer both syphilis and gonorrhea was announced at the meeting of the American Public Health Association in New York.

Apparent cures of four cases of early syphilis by penicillin were reported by Dr. John F. Mahoney, Dr. R. C. Arnold and A. Harris of the U. S. Public Health Service's Marine Hospital on Staten Island. Other patients are now being treated, but in only four cases has enough time elapsed for the doctors to be sure the disease has been cured. The penicillin is injected into the patient's muscles every four hours, day and night, for nine days. At the end of the first seven hours of this treatment, the spirochetes that cause syphilis can no longer be found in the syphilitic sores. Blood tests are strongly positive at the start, negative by the 15th day. By the 100th day after treatment had been stopped, no trace of the disease could be detected in the patient's blood by any of the ten most delicate tests for this disease now known.

This speedy cure of syphilis can also be achieved, but not so safely, by the intensive treatment methods devised in recent years. These methods all depend on giving the patient massive doses of arsenic in some form and are consequently dangerous. Penicillin seems to be absolutely safe. No one using it has yet discovered any sign of a poisonous effect from this mold chemical. Some of the patients getting it for syphilis felt a little sick and feverish the first day but that, Dr. Mahoney explained, was due to the large scale destruction of syphilis spirochetes and not to the penicillin itself.

Gonorrhea is also yielding to attack by penicillin but that is not so surprising. The germs that cause gonorrhea belong very far down in the scale of living organisms. The spirochetes of syphilis are much higher in the biologic scale, close to the protoza which are not far from animal forms of life. For a chemical to be able to kill such higher forms of life without carrying any threat to human life is so remarkable that Dr. Mahoney and associates feel "stunned" by the results they have achieved. Only the fact that they have had long experience in the anti-syphilis fight and have facilities and ability for doing very precise work makes them feel that successful results of treatment in only four cases can be presented as cures.

Science News Letter, October 23, 1943

ASTRONOMY

New Exploding Star Discovered by German

➤ A NOVA, or new exploding star, has been discovered by the German astronomer, Dr. C. Hoffmeister. Located in the constellation of Aquila, the eagle, the nova was of the twelfth magnitude when discovered on Sept. 5.

The nova was found near Altair, the bright star in the constellation of Aquila. Dr. Hoffmeister reports that the outburst occurred between April 13 and May 2 of this year, at which time the nova attained the seventh magnitude.

Aquila is now visible in the evening sky in the southwest, but the nova is too faint to be seen without a telescope. Even at the time of its greatest brightness, the star was invisible to the naked eye, as only those of the sixth magnitude or brighter can be seen without aid.

Novae are not really new stars at all, but old stars which suddenly increase in brightness. The increase in light from minimum to maximum takes only a few days, but the decline is much slower. The cause of the explosion which creates this flare-up in the star has not been established.

News of the nova was telegraphed to Harvard College Observatory, clearing house for astronomical news in the Western Hemisphere, by way of Dr. A. Korff of Berlin, Dr. E. Strömgren of Copenhagen and Dr. K. Lundmark of Lund, Sweden.

Photographs in the Harvard collection indicate, according to Dr. Sergei Gaposchkin, that the nova reached its greatest height about April 28. Since that time it slowly declined in brightness from between the sixth and seventh magnitude to the twelfth magnitude.

Science News Letter, October 23, 1943

***X-RAY CHECKER**—A hand grenade will explode prematurely if the powder charge is less than the required amount. To prevent this, the General Electric Company devised this machine to check the powder charge in each fuse. When a bad fuse is found by an electric eye, a bell rings, a red lamp is lighted, a dab of red paint is placed on top of the bad fuse and a recording is made on a chart. Four thousand tubes pass through the machine in an hour.*

MILITARY SCIENCE

Gas Mine Detonator

If Axis uses poison gas before the war is over, U. S. Army is prepared with "surefire exploder" for gas. It looks like a clothesline.

➤ IF THE AXIS uses poison gas before the war is won, a peacetime mining product will prove President Roosevelt's assertion that the United States is more than ready for this phase of warfare, according to the War Department.

This product, in appearance, is innocent enough for it looks like a clothesline. It would be used primarily to detonate gas mines laid to delay or incapacitate enemy troops, although it is itself a rapid, powerful explosive.

It is called primacord and was developed in 1936 for use in the mining industry. But it is not a fuze, a mechanical device with or without combustibles used to explode a main charge. Nor is it a fuse, the name given to a train of combustibles used to explode a main charge after being ignited, similar to a dynamite fuse. It is an explosive used generally for setting off a number of charges simultaneously and, thus, would technically become a combination fuze and fuse. It must be detonated electrically or mechanically and, by leading from the detonator to one or more charges, becomes a fuse also.

Primacord can be laid for miles, and when set off the explosion takes only one second to traverse more than three-and-a-half miles of the cord.

The cord, developed as a substitute for a lead-covered detonating fuse, can itself tear down a tree 15 inches in diameter when used in sufficient quantity. It can, naturally, be used under water. Laid on the ground, it can be exploded to clear a two-foot-wide path of small brush and at the same time dig earth from two to four inches deep, throwing it over a wide area. It can withstand rough handling, making it highly valuable in the field. It will stand friction, can be beaten with a hammer and burned like paper without exploding.

***PREPARED**—These members of a Depot Company, wearing masks, impervious clothing and rubber gloves, are filling land mines with chemical agents which can be set off by primacord.*

The Corps of Engineers uses it a great deal in demolitions, but one of its principal uses at present is by the Chemical Warfare Service of the Army Service Forces for training troops in best methods of setting off chemical land mines.

Chemical Warfare troops are vital in combat service, especially if gas is being used and a strategic withdrawal is ordered. It is their task to aid in slowing the enemy's advance, just as engineers now lay mines and booby traps to slow up the enemy.

It is the duty of Chemical Warfare troops, also, to prevent the enemy from using certain areas by dispersing gas in that area; and if the enemy has laid down gas, to assist in decontaminating the area. In this latter work, primacord may be laid and exploded above ground when it blasts open a path a foot wide on each side and tears up the earth, aiding in neutralization of the contaminated area and permitting passage of troops.

In setting off chemical mines, primacord is tied in eight-foot lengths around each mine and each mine is connected with primacord. When detonated, the mines explode simultaneously and fling the contents over a wide area, thus forcing the enemy to detour or halt long enough to decontaminate the area.

Primacord is packaged in varying lengths and has many advantages over other methods of simultaneous explosion of land mines. Chemical Warfare Service authorities say it is much faster, more dependable and requires less time and labor for use. The Service calls it their "surefire exploder."

Science News Letter, October 23, 1943

PUBLIC HEALTH

Meningitis on Increase As Paralysis Declines

➤ WITH the infantile paralysis epidemic definitely on the down grade, health authorities are now anxiously watching another threat to the nation's health, meningitis. The situation may be worse this year than last.

The number of meningitis cases reported by state health officers to the U. S. Public Health Service was high last winter, continued at a high level this summer and now is climbing even higher. Total for the week ending Oct. 2, latest on which figures are available, was 192. This represents a steady climb from 135 reported the week of Sept. 18 and 178 the week of Sept. 25.

The number that would normally be expected, based on the median for five years, is 27 cases for the last week in

September. Total meningitis cases since the first of this year were 14,523, compared to a five-year median figure for the year to date of 1,602.

Infantile paralysis cases dropped to 679 for the week ending Oct. 2, from 818 the preceding week. Decreases were particularly notable in those states previously reporting the largest number of cases: California, Texas, Kansas and Illinois.

Science News Letter, October 23, 1943

MEDICINE

Vaccines Against Virus

Protection against certain virus diseases, such as virus pneumonia, may be provided by serums and vaccines from the blood of hens and roosters.

➤ VACCINES to protect against certain virus diseases, such as virus pneumonia, parrot fever and lymphogranuloma venereum, or antiserums to cure the diseases may some day be developed from chicken blood, it appears from a report by Maurice R. Hilleman and Dr. F. B. Gordon, of the University of Chicago. (*Science*, Oct. 15)

A chicken antiserum that definitely protects mice against a virus pneumonia peculiar to these animals has been developed by the Chicago scientists. A single dose of the antiserum given either before or after a dose of pneumonia virus has a protective effect, but an even greater effect is obtained when several doses of the antiserum are given during the first three days after the pneumonia virus infection.

This mouse pneumonia is caused by a virus which is very definitely related to the viruses that cause the human diseases, parrot fever, lymphogranuloma venereum, meningopneumonitis, trachoma, inclusion conjunctivitis and some of the atypical pneumonias now being reported in increasing numbers of cases.

So far it has been impossible to produce vaccines or antiserums for these diseases by the usual methods, such as inoculating horses or rabbits to produce virus-fighting antibodies in their blood. In fact, not even enough virus-fighting antibodies can be produced in the blood of such animals to provide good material for diagnostic tests or tests to help distinguish various unfamiliar virus diseases from each other.

Inoculating the virus into roosters seems to do the job, at least to the extent of producing a plentiful supply of mouse pneumonia virus antibodies in the rooster's blood. Serums with enough human disease virus antibodies for test purposes at least can probably be produced from chicken blood by the same methods.

"It is also possible," the Chicago scientists state, "that such serums would prove of value in treatment of human infections with these agents. Further investigation along these lines is under way."

Science News Letter, October 23, 1943

MEDICINE

Hope for TB Conquest

Expectation that new drug, Diasone, may wipe out dread disease is strengthened by the favorable results in tests on guinea pigs.

➤ HOPE that a chemical may yet be developed which can conquer tuberculosis as the sulfa drugs have conquered pneumonia and other infections appears in a report by Dr. George W. Raiziss, of the Abbott Laboratories. (*Science*, Oct. 15)

Diasone is the short name of the drug which is the latest white hope for a medicine that will cure tuberculosis. Tests on guinea pigs of this and various other compounds, including Promin which has also given promise of curing tuberculosis, show that Diasone "produced the most beneficial" results in treating tuberculosis in the guinea pigs, Dr. Raiziss reports.

The full chemical name for Diasone is disodium formaldehyde sulfoxylate diaminodiphenylsulfone. Promin is a derivative of diaminodiphenylsulfone. Both Promin and the chemical from which it was derived were developed after attempts to cure tuberculosis with sulfanilamide failed. The hope was that some chemical modification of sulfanilamide might give it tuberculosis-conquering powers.

Diaminodiphenylsulfone itself is toxic to mice, but can be detoxified, Dr. Raiziss discovered, by combining it with sodium formaldehyde sulfoxylate.

The detoxification which apparently makes it safe does not reduce its power as a germ-fighting remedy. In mice Diasone is as effective as sulfanilamide in curing streptococcus infections, Dr. Raiziss reports, and almost as effective as sulfadiazine in curing Type II pneumonia.

Its most important property as a germ-fighter, however, is its action against experimental tuberculosis in guinea pigs.

"With its background of low toxicity and effectiveness in experimental infection," Dr. Raiziss states, "this drug gives promise of favorable clinical application in tuberculosis."

Science News Letter, October 23, 1943

MEDICINE

New Plaster Cast Treatment Of Burns Has Good Results

➤ GOOD RESULTS with a new plaster cast treatment for burns of arms, legs, feet and hands are reported by Dr. Stanley M. Levenson and Dr. Charles C. Lund, of Boston City Hospital and Harvard Medical School. (*Journal, American Medical Association*, Oct. 2)

Possibility that the method may in the future be used for treating burns in the armed forces appears from the fact that the work reported was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Harvard University. Further suggestion of this appears in the emphasis the doctors put on the wide availability of the materials needed for the treatment, their lack of bulk and the fact that the cast will protect the burned extremity from injury if the patient has to be moved.

Healing is as rapid as with other methods of treating burns, the doctors state and ability to move the burned arm, leg or hand returns more rapidly.

The lack of pain felt by the patients, from the start of treatment to complete healing is described as "remarkable." As soon as the cast is on, the pain disappears. A slight dull ache was felt for

three days by three of eight patients whose cases are reported. A total of 22 patients have had burns treated in this way with "very satisfactory" results.

The casts do more than give the burned part rest and protection from further injury. They prevent swelling, which other scientists have recently reported as a harmful feature of burns, and prevent slowing of the blood circulation in the burned area. The prevention of swelling also means that less plasma is being lost from the burned area, and in large burns this would lead to considerable saving in the amount of plasma that would have to be given the patient.

Applying the cast is relatively easy. The casts used for the burn cases are thinner and lack the bulky padding of casts for broken bones.

Science News Letter, October 23, 1943

MEDICINE

Meningitis Stopped

Epidemics of meningitis can be halted almost instantly by using sulfadiazine as a prophylaxis; methods for Army can be applied to civilians.

➤ MENINGITIS EPIDEMICS can be stopped almost immediately by prophylactic use of sulfadiazine, Col. Dwight M. Kuhns and Capt. Harry A. Feldman, of the Army Medical Corps, reported at the wartime conference of the American Public Health Association, from their experience in the Fourth Service Command.

Chief difficulty heretofore in stopping a meningitis epidemic has been that, although the patients were isolated, it was impractical if not impossible to find and isolate all the healthy carriers of the germs.

Giving small doses of sulfadiazine to all the personnel of a single unit at the same time immediately after the first cases signal the approach of an epidemic will immediately eliminate all the carriers and at the same time reduce the attack rate, or new cases, almost to zero, the Army medical officers found.

Careful laboratory methods for detecting the carriers and identifying the type of meningococcus they carry are important, they emphasized. The type of germ predominating is a forecast of the extent and rapidity of the impending epidemic.

The laboratory and prophylactic methods worked out for the Army, they state, can be applied equally well to certain civilian groups, such as schools, orphanages, asylums, camps and the like.

Science News Letter, October 23, 1943

Salmonellosis Danger

Ordinarily not considered a serious health problem, salmonellosis, or diarrheal diseases due to infection with salmonella, become a constant threat under war conditions, Dr. A. Daniel Rubenstein and Dr. Roy F. Feemster of Boston, Mass., warned. Paratyphoid fever is caused by some members of the salmonella germ family. Often infection with these germs is mild and the patient may not even see a doctor, but about half of 294 cases Dr. Rubenstein and Dr. Feemster studied were serious enough to require hospitalization. The disease may be fatal in the aged and debilitated.

The infections are spread through the population in small family outbreaks, the doctors believe. Almost half the patients are infectious and capable of spreading the germs for at least four weeks after onset of their illness, and often the infection persists for two, three or four months even though the patients are no longer sick.

Science News Letter, October 23, 1943

Sterilization of Air

Fighting epidemics of influenza and similar air-borne disease by chemical sterilization of the air seems nearer to practical application as a result of studies reported by Burgess H. Jennings and Dr. Edward Bigg, of Chicago at the wartime conference of the American Public Health Association.

Triethylene glycol vapor can instantaneously kill all the bacteria in the air of a room of 10,000 cubic feet capacity, they report. The ability of this chemical, familiar as a relative of a popular antifreeze mixture for automobile radiators, to sterilize the air has previously been shown in small, experimental chambers.

The studies reported show that it can be used in fairly large rooms of about classroom or hospital ward size, or offices in which a number of people work. Whether sterilizing the air in this way will keep infections from spreading has yet to be determined, but experiments so far, the scientists state, "leave little doubt that this will be the case."

The triethylene glycol was used in the form of a vapor.

This vapor distributed itself readily throughout the room, in a manner similar to water vapor. Fans aided in a more rapid and uniform distribution. Maximum killing effect on the bacteria is obtained with a relative humidity of 35% to 40%.

One device used to generate the glycol uses the principle of atomization and can be incorporated into the pre-existing duct systems of air-conditioning units. Another device generates the vapor by heating a solution of the chemical.

The rate and concentration of the vapor generated must be determined by the number of air exchanges in the room air. For practical use, an instrument must be developed to control operation of the generator, starting and stopping it as the concentration of the glycol in the air changes, something as a thermostat regulates a furnace.

Science News Letter, October 23, 1943

Shortening Convalescence

➤ SICK and wounded men of the Army Air Forces get well faster and go back to military duty in "top" physical condition as a result of the convalescent-rehabilitation training program in Air Forces hospitals, Brig. Gen. David N. W. Grant, the Air Surgeon, reported at the wartime conference of the American Public Health Association.

The program has been in operation for the past seven months, General Grant reported. During this time approximately 16,000,000 man-hours in physical and educational training have been given and the teaching rate at the present time is about 2,500,000 man-hours per month.

The sick soldiers are reconditioned physically by a planned and organized physical rehabilitation program. At the same time, the many hours of convalescence that are usually wasted are used for the educational program designed to disseminate knowledge and thereby make these men better soldiers. If the man can not go back to military service, he is helped by this program to return to productive civilian life.

Science News Letter, October 23, 1943

Vaccine Affects Wassermann

➤ PREVIOUS vaccination against smallpox may cause a false positive reaction to the Wassermann test for syphilis, Dr. J. M. Lubitz of Chicago warned.

A large proportion of service men successfully vaccinated against smallpox gave such false positive reactions, he found. Since large numbers of Americans are vaccinated against smallpox at least once in their lives, and since the Wassermann test is now "accompanying the average citizen from the 'cradle to the grave,' " Dr. Lubitz declared that many mistakes in diagnosis may be made unless physicians and health officers are aware of the possibilities.

Science News Letter, October 23, 1943

CHEMISTRY-NUTRITION

Tips for Coffee Makers

Only four ounces actually used out of each pound of coffee bought; expert gives advice on best methods of brewing and storing.

➤ HERE ARE TIPS from an expert on how to brew and store your coffee properly to improve its taste and give you full purchase value. Prof. Leslie H. Backer, professor of chemistry at the Stevens Institute of Technology in Hoboken, N. J., points out that of all the coffee we use, only 25 per cent is soluble in water. Thus in a pound of coffee, we actually use only four ounces. In order to obtain the fullest benefits of these four ounces, we should treat coffee with the delicacy it deserves.

Coffee should be well ground for use in a particular type coffee maker, and the ground coffee should never be in contact with water for more than five minutes.

Prof. Backer emphasizes that in making coffee with a glass vacuum coffee maker, water should be boiling before the upper bowl is put on. When the water rises into the mixture it should be stirred in one direction and then in the other for thirty seconds.

In the drip method, clear water should be steadily poured through the coffee. One drip operation is sufficient, as his experiments have shown that actually five per cent less extraction is obtained when the water is poured through the second time. A pot should be obtained that fits the needs of the entire family, and then used to full capacity.

If you have a percolator, preheat the pot or start with hot water before putting the coffee into it.

Keep coffee pots scrupulously clean. Oils that remain on the pot from previous brewing decompose in air and after 24 hours emit a vile odor in addition to having a bad taste. If a filter cloth is used, wash it well in cold water and keep it under cold water until used again. This prevents the air from getting at any of the fatty oils that may have remained on the cloth.

Since 15 per cent of the coffee is fat, it should be treated as one would butter and other fats. Coffee should be kept in tightly covered jars or containers in a refrigerator. High temperatures tend to decompose the fats and destroy the coffee's value.

Moisture and odor are easily absorbed by coffee. Prof. Backer exposed a one-pound jar of coffee to air in hot weather and found it to be 17 ounces on reweighing.

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***COFFEE BREW**—To determine the percentage of extraction in a coffee brew, Prof. Backer first draws 50 cc. of the brewed coffee into a pipette, from a measured amount of the brew. The coffee is emptied into a porcelain dish and placed in an oven where the heat drives away the water. After it is cool, the coffee extract remaining in the dish in solid form after the evaporation is measured with a delicate balance to calculate the percentage of extraction.*

PUBLIC HEALTH

Physical Fitness Improved Under War Conditions

➤ THE GENERAL physical fitness of American college men has improved under war conditions if the men studied by the department of physical education at Syracuse University are typical.

The average physical fitness score at the university this year shows a 23-point improvement over last year. This year's score of 114.2 is five points higher than the best for any year during which the record has been kept.

Out of every hundred men tested this year 88 are as healthy or healthier than the average of those tested last year, the college records show.

The physical fitness rating is essentially an indication of strength. Final averages consist of scores made on tests of arm, leg and back power, hand grip and lung capacity.

Science News Letter, October 23, 1943

A new type of *piano* contains only 35 pounds of metal, a saving of about 150 pounds; the heavy plate is made of laminated plywood instead of metal.

MEDICINE

Green Light Signals Ringworm Scalp Infection

➤ A GREEN LIGHT, traditional safety signal, reverses itself and becomes a danger signal during epidemic of ringworm of the scalp, it appears from the report of Dr. Rhoda W. Benham of New York City, to the wartime conference of the American Public Health Association in New York.

Every infected hair on the head of a child with ringworm of the scalp will show a brilliant green fluorescent light against a dark background when artificial sunlight (filtered ultraviolet) shines on the infected head.

Often a child whose scalp looks perfectly normal to the physician, Dr. Benham stated, will show green when this test is applied.

This test, therefore, will help stop the spread of the infection by detecting children who have ringworm and who need to be isolated and treated.

Determining the species of fungus causing the ringworm by laboratory tests is also important because one of the two fungi common in this country is very hard to get rid of. The only sure treatment for cases of this type, Dr. Benham said, is removing the hair by X-ray.

Failure to use such tests in the beginning of an epidemic now present in New York City and improper treatment, she stated, have resulted in the spread of the infection until at present every part of the city and many areas in Long Island have become involved.

Science News Letter, October 23, 1943

GEOLOGY

Geologists Neglected In the War Effort

➤ THE ARMY and Navy need geologists—but very few of the geologists now in the Armed Services are given the opportunity to use their technical skills, Dr. Kirk Bryan, professor of geology at Harvard University, reports. (*Science*, Oct. 1) Creation of a geologic staff in the armed services to advise on problems of construction, tactics and strategy was suggested by Dr. Bryan to remedy this paradox.

Based on his own survey of what 318 Harvard-trained geologists are now doing for the war effort, Dr. Bryan states that the proportion in the Army and Navy is fairly high; 10 with Ph.D. degrees; 11 with master's degrees; 17 men who have done graduate work; and 5 college graduates who are recognized geologists—13.5 per cent of the total. Many other geologically trained men, who intend to be geologists and have adequate training, might be used as valuable field assistants.

"Very few geologists are satisfied that the full value of the profession or of its personnel is appreciated," asserts Dr. Bryan. "Of the group in uniform, 17 are mature men who are in specialized positions of research and administration which appear to be suitable to their talents. Men under 40, however, are mostly performing ordinary military or naval duties, for which they are presumably qualified, but which seem below their capacities. Every geologist believes that the Army and Navy need geologists as advisers on construction, on tactics and on strategy. If these men were used as geologists, the situation would be more satisfactory. There are also others qualified and willing who could be recruited for duties in military geology. It appears, however, that a considerable fraction already in uniform are not being used to best advantage."

Science News Letter, October 23, 1943

MEDICINE

Grant of $75,000 Made To Aid War Medicine

➤ A GRANT of $75,000 has just been made for collecting up-to-the-minute information on war medicine and making it available to members of the medical profession. The money is provided by the Johnson and Johnson Research Foundation to the National Academy of Sciences and the National Research Council.

This grant is made to help overcome one of the greatest difficulties in medicine today: that of providing adequate current information to the medical officers of the armed services both in this country and abroad, and of making the experiences of war medicine available to civilian physicians.

The project will be administered by the Division of Medical Sciences of the National Research Council, under the chairmanship of Dr. Lewis H. Weed. Various medical reports, both civilian and military, from all parts of the world will be culled for pertinent information. Bulletins containing current advances in medical practices and medical research which are not military secrets will be issued. Studies which cannot be released now will be carefully held for later release.

Science News Letter, October 23, 1943

IN SCIENCE

AGRICULTURE

Soybeans of Recent Crop Needed for Making Sprouts

➤ INTRODUCTION of soybean sprouts into the American diet has brought an unexpected demand upon the seed-testing laboratory of the New York State Experiment Station at Geneva for sprouting tests of stocks of soybean seed offered for sale for soy sprouts.

Tests show that stocks of soybeans for sprouting purposes must be the best of recent crops, with strong and prompt germination of about 90%. Even stocks of soybean seed which germinate fairly well and produced an acceptable crop in the field did not prove satisfactory for making sprouts, since many of the seeds were visibly or invisibly cracked through thresher operations or other causes.

Any failure on the part of the housewife to get good sprouts, the report says, should be considered as probably due to use of weak, foul or non-germinating soybeans and should not discourage her from trying the delectable food when she locates a good source of soybean seed for sprouting. Responsible processors are trying to locate adequate and good stocks for packaging.

Science News Letter, October 23, 1943

ELECTRONICS

Radio Tube Merry-Go-Round Speeds Up Production

See Front Cover

➤ THE GIANT rotating exhaust machine shown on the front cover of this week's SCIENCE NEWS LETTER speeds up the production of electronic tubes needed for military communications equipment. The tubes are "baked" at a temperature of 1,000 degrees Fahrenheit as they pass through the oven tunnel shown at the right in the picture. At 10 different locations on this "merry-go-round" at a Westinghouse Lamp Division plant, high frequency induction heater coils raise the temperature of tube parts to more than 2,000 degrees Fahrenheit to drive out unwanted gases. At the same time, vacuum pumps exhaust the air and gas. The tubes then are sealed and removed by the operator.

Science News Letter, October 23, 1943

CE FIELDS

MEDICINE

Powerful Germ-Fighters Fail Against Influenza

➤ A TOTAL of 26 powerful germ-fighters have been tried out as possible weapons against influenza and found wanting by the Naval Laboratory Research Unit No. 1 at the University of California.

"None of the compounds tested under the conditions of this experiment, alone or in combination, was effective in preventing influenza infection in mice," Captain A. P. Krueger, officer-in-charge, and his associates report. (*Science*, Oct. 15).

Penicillin, the powerful germ-fighter from mold, other chemicals from microorganisms and the sulfa drugs were included in the 26 compounds tested. The tests were made by injecting the compound into white mice daily for 12 days. On the second day each animal had instilled into its nose a mouse lung virus suspension containing 10 killing doses of influenza A virus.

Science News Letter, October 23, 1943

ASTRONOMY

Star in Cepheus Found Double with 50-Year Period

➤ A STAR in the constellation of Cepheus has been found to be the bright member of a double star team with a period of about 50 years. The eccentricity of the orbit of this binary, Beta Cephei, is equal to 0.66, reports Dr. Burke Smith of the Yerkes Observatory. (*Astrophysical Journal*, July)

The average period during which the star alternately seems to approach and recede from the sun is slowly lengthening, Dr. Smith states. During the past 25 years this increase has amounted to 0.43 seconds. This is at a rate of 1.7 seconds a century, which is a decided change when one considers the life of an average star. The data available are so limited, however, that Dr. Smith finds it impossible to decide if this increase is occurring spasmodically or at a constant rate.

This star is typical of a small group of B-type stars with variable radial velocity. Their periods are less than half a day and the velocity ranges so small that they can scarcely be explained in terms of binary motion.

An abrupt change in the length of the period of Beta Cephei occurred when the orbits of the two components brought them closest together in 1914-16. After periastron the period began to lengthen and is now found to be 0.1904886 day.

There seems to be no conclusive evidence of a change in ionization or excitation with the change in phase, Dr. Smith points out. The ionized helium lines are visible on a few plates, but no definite correlation of the visibility of these lines with phase was found.

During the period considered the star has gone through some seventy thousand complete cycles. Dr. Smith's study was based on measurements of Yerkes plates taken in 1940-42, and a review of all published radial-velocity measurements of the year since 1906.

Science News Letter, October 23, 1943

PUBLIC HEALTH

Emergency Medical Service Helps War Industries

➤ THE MILLIONS of workers in our war industries have a better chance of surviving major disasters, such as munitions plant explosions, because of EMS, it appears from a report by Dr. Ward L. Mould, of the U. S. Public Health Service, at the conference of the American Public Health Association.

The initials stand for the Emergency Medical Service which most city governments have established as part of their civilian defense activities.

Organized primarily to protect the community in event of enemy action, it has proved valuable in disasters unrelated to enemy action, such as the Cocoanut Grove fire in Boston and various disastrous railroad accidents.

Its value to industry was explained by Dr. Mould, who was loaned by the Public Health Service to the Office of Civilian Defense to direct the organization of EMS. Before the war, he pointed out, there was no central point in a community to which the industrial plant doctor could appeal for medical service in an emergency. He had to call hospitals for ambulances, physicians and nurses, or appeal to the police or fire department to arrange for the necessary assistance. Now he can call on the community's Emergency Medical Service which is ready, day and night, to mobilize immediately doctors, nurses, ambulances, hospital beds, plasma and whatever else may be needed.

Science News Letter, October 23, 1943

BIOLOGY

Seven Latin Americans Receive Fellowships

➤ SEVEN out of 15 Guggenheim Latin American fellowships went to biologists, most of whom are engaged in studies in this country that will increase or protect the food production of our good neighbor republics.

The fungus-growing ants of Brazil, chief enemies of that country's agriculture, will be investigated by Mario Autuori of Sao Paulo, while Raúl Cortés Pena of Chile's Ministry of Agriculture will develop methods of control of insect pests.

José Antonio Goyco of Puerto Rico's School of Tropical Medicine will work on the production, processing and preservation of tropical foods, and Dr. Isabel P. Farfante of the University of Havana, only woman to hold a fellowship this year, will be concerned with increasing the supply of mollusks and crustaceans in Cuban waters.

Betterment of South American forage crops will be the concern of Juan Ignacio Valencia of Buenos Aires.

Other fellows in biology are Dr. Gabriel Gasíc Livacíc of Santiago de Chile and Dr. Fabio Leoni Werneck of Rio de Janeiro.

Jaime Lifshitz Gaj of Mexico's Institute of Physics will study with Prof. George D. Birkhoff at Harvard.

Two economists, two historians and one poet were also given fellowships.

Science News Letter, October 23, 1943

PHARMACY

Uncle Sam Drafts Supply Of Oil of Peppermint

➤ THE ENTIRE supply of oil distilled from the peppermint plant has been ordered set aside for government action to secure a just distribution.

Oil of peppermint is important in both food preparations and pharmaceutical uses, particularly for menthol production. Most of the menthol used in the states was formerly imported from Japan.

American farmers since the war have attempted to increase the production of oil of pepperment to meet growing civilian, military and Lend-Lease requirements. Most of the United States supply is produced in Michigan, Indiana, Ohio, California and Oregon. Unfavorable weather conditions this year caused domestic production to fall short of the goal.

Science News Letter, October 23, 1943

GENERAL SCIENCE

Winners in Research

Many boys and girls selected in the first and second Science Talent Searches already in positions directly aiding the war effort.

➤ SCIENTIFICALLY talented boys and girls are making real contributions to the winning of the war through research in laboratories, in war plants and in the armed services.

These promising young people were selected in the first and second Science Talent Searches conducted in 1942 and 1943 among the high school seniors throughout the United States. Another group of potential scientists will be selected in the Third Annual Science Talent Search now in progress which will end December 27. The winners for 1944 will be announced in February. It is anticipated that at least 15,000 secondary school students will participate.

Here are a few of the war jobs filled by Science Talent Search winners:

Marina Prajmovsky of Farmingdale, N. Y., now a student at Radcliffe College, was the girl winner of the Westinghouse Grand Science Scholarship in the 1942 Science Talent Search. She has spent her long summer vacation working in the Naval Research Laboratory in Washington where she served as a chemical analyst. She was given samples of war materials and it was her task to discover their chemical content.

Paul Cranefield of Madison, Wis., worked this summer in the laboratory at the University of Wisconsin where research in war materials is carried on 24 hours per day. Paul is the only undergraduate allowed in this highly war-secret laboratory. He is one of those whose talent for chemistry was revealed by the Science Talent Search in 1942. The judges had a tough time convincing him that going to college would be well worth his time. His excellent record for his first year at the University of Wisconsin indicates that the judges were not wrong and that this country is going to have one more valuable chemist so essential for war or peace.

Works For Physical Chemist

At Cornell University another 1942 winner, Wolf Karo, of Utica, N. Y., is employed in the laboratory of a physical chemist where he makes mathematical and other intricate calculations so necessary that he has been draft-deferred to continue his work.

Herbert Halberstadt, a winner in 1942, commuted from his home in New Hyde Park, N. Y., to Bloomfield, N. J., this summer to work as a student engineer in the Lamp Division of the Westinghouse Electric and Manufacturing Company. The money he has been able to save from his salary will supplement his scholarships this fall at George Washington University where he is starting his sophomore year in engineering.

Julia Ann Wien, a winner in 1942 from Esterly, Pa., returned to Cedar Crest College for her second year after spending the summer as a chemist in the paint-testing laboratory of the Wilhelm Paint Company in Reading, Pa.

Robert Palombi, a 1943 winner, spent his vacation from St. Mary's College (Minn.) at Alexian Brothers Hospital in his home city, Chicago, as a student assistant in the clinical laboratory learning techniques that he will use in his career as a physician.

Evelyn Alice Pease, winner in 1942, spent her spare time last year as a half-time assistant in the Research Laboratory of Mead, Johnson Co. in her home town, Evansville, Ind., at the same time carrying a full scholastic schedule at Evansville College.

Vacation As a Chemist

William Calhoun, of Glendale, Calif., a 1942 winner, finished his first year at the University of Redlands, and took a job for the vacation as a chemist at the Lockheed Plant in Burbank. This fall he hopes to go to college and continue his job too.

Judith Cassidy, a winner in 1943 from Irvington-on-Hudson, N. Y., worked this summer in the plastics laboratory of the Anaconda Wire and Cable Co. at Hastings, N. Y., where she learned more about koroseal and vinylite than she "ever expected to know." Working only 20 feet from laboratories where new products were being perfected she "acquired the odors, if not the formulae, of some interesting processes." This fall, entering Mt. Holyoke on a scholarship, she will dry dishes once a day to do her share in the labor shortage.

Other winners contribute to the war by working in laboratories while they are still college students.

Hugo Korn who lives in Chicago and won a trip to Washington in 1942 is now in his first year at the Technological Institute of Northwestern University where he has been awarded a scholarship. He spent some time this summer working in a radium laboratory.

Arthur Ortenburger, Jr., 1943 winner from Norman, Okla., attends the University of Oklahoma where he helps to defray expenses by working as a student assistant in the department of animal biology.

At least 8 of the 80 winners are now in the Army being trained as meteorologists for the Air Forces, as laboratory technicians in the Medical Corps, and at colleges or technical schools in the ASTP.

Ten Winners in Navy

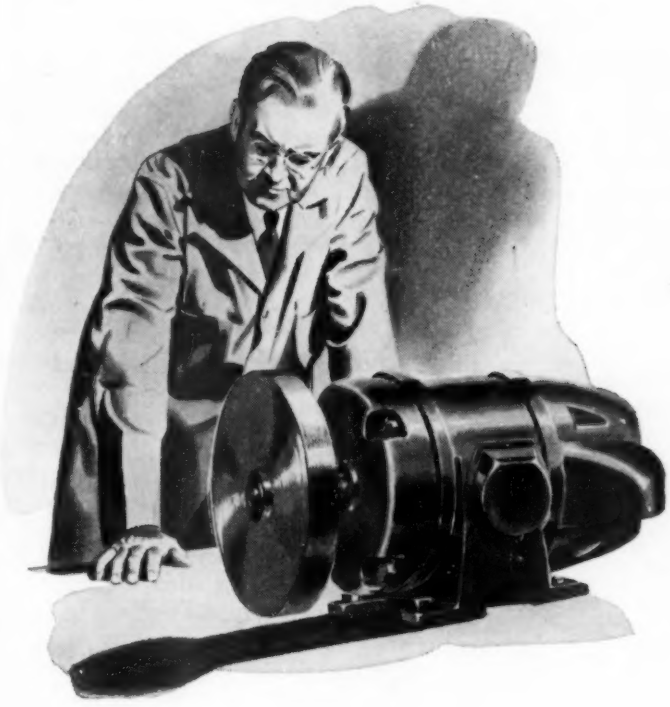
Ten of the winners are in the Navy and are assigned to training in colleges, universities and technical schools under the V-12 program.

For all those now in governmental war services—and those who will enter later when they are old enough—the Westinghouse Science Scholarships are being held for their return to civilian life when all of them plan to continue their educations.

All those not in the armed services are now studying at colleges, universities and technical schools. By accelerated programs and summer school sessions they are attempting to finish their courses as rapidly as possible. For boys there is an urgency to finish as much as possible before going into active service. But the girls feel the need for hurrying too and are proud to report they can cut down time by passing proficiency exams, attending extra sessions, etc. All of them are hoping to be ready as soon as possible to do their share toward winning the war. All winners who have needed them have been successful in winning scholarships in addition to those awarded in the Science Talent Search. Many of them are financing their college careers entirely from their own awards and earnings.

Inquiries about the Science Talent Search or requests for entry blanks in the Third Annual Science Talent Search should be sent to Science Clubs of America, 1719 N Street, N. W., Washington 6, D. C.

You can't see it . . . but it's there



THE MOST ACCURATELY machined rotating part ever built—although apparently in balance to the naked eye—may be *out of balance.*

You can't see the unbalance . . . even if it's there.

With the rapid development of high-speed machines, the need for *locating and correcting* unbalance in rotating parts has become vitally important—if you want smooth, vibration-free operation and long life.

In 1933, scientists in the Westinghouse Research Laboratories tackled this problem of quickly and accurately measuring the *static* and *dynamic unbalance* in rapidly whirling masses—both symmetric and asymmetric.

Through painstaking study and experiment, these Westinghouse research engineers discovered a totally new principle for balancing rotating parts of every shape and form . . . the "Dynetric Balancer."

Today, the Gisholt Dynetric Balancer . . . using Westinghouse *electronic equipment* . . . is solving the most difficult balancing problems in many war plants.

With this machine, vibrations as small as *twenty five millionths* of an inch in crankshafts, armatures, turbine rotors, propellers, and countless other whirling parts are located and measured in a matter of minutes, or even seconds!

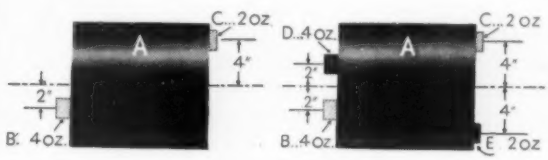
Westinghouse Electric & Manufacturing Co., Pittsburgh, Pennsylvania.

THE PROBLEM OF UNBALANCE

Static unbalance

(*Left*) Disc A is *statically unbalanced* by the 4 ounce weight, B, placed 2 inches from the axis.

(*Right*) This *static unbalance* can be corrected by placing a 2 ounce weight, C, 4 inches from the axis.

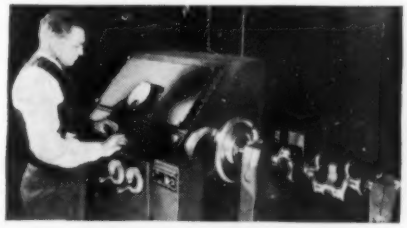


Dynamic unbalance

(*Left*) Cylinder A is *statically balanced*—by the weights B and C—but *dynamically unbalanced* by the twisting effect of these weights when the cylinder is rotated.

(*Right*) This *dynamic unbalance* can be corrected by placing weights D and E, as shown.

. . . AND ITS SOLUTION



On this Dynetric Balancer, *combined* static and dynamic unbalance in engine crankshafts is accurately and quickly measured by instrument readings. Corrections are then made by drilling holes in the crank arms.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

TIRE CHANGER—This new Firestone bead-loosening tool makes it easier to remove heavy truck and tractor tires stuck to their rims. One of the detachable hooks has been forced, by leverage, between the tire iron and the rim. This exerts tremendous downward pressure on the tire, forcing the bead away from the rim.

MEDICINE

Statistics Show that Cancer is Curable

➤ TOO MANY people still look on cancer as an absolutely hopeless condition. Dr. Ira T. Nathanson, of Harvard Medical School, challenges this gloomy view. (*New England Journal of Medicine*, Sept. 16)

"It is a well-accepted fact," he declares, "that present-day treatment is effective in the early stages of the disease, before it has spread to distant organs or tissues that are essential to life. Moreover, the prognosis is far from hopeless, even in more advanced cases."

In several forms of cancer, he adds, "the rate of cure is higher than that of some other diseases."

The chances for any given patient being cured of cancer depend on many factors, such as the location of the cancer, the type of cancer, and how early in the disease treatment is started.

In cancer of the skin, for example, the curability rate is 48 to 68%. In cancer of the breast the relative curability rate, based on results five years after operation, ranges from 30 to 51%. The absolute curability rate, for all patients who have treatment of any kind including that which is merely palliative, is 22 to 28%. In cancer of the stomach, the five-year curability rate of all patients who enter the hospital is 5%. When operation is possible, however, and it is in about half the patients with stomach cancer, the outlook is much brighter, with survival rates of from 15 to 50%.

Even when cancer is discovered too late for an absolute cure to be achieved, suitable treatment can often give the patient many months or even a few years more of comfortable life. No one who thinks he has cancer should feel too discouraged or frightened to see a doctor. The condition may not even be cancer, and if it is, the outlook may be much brighter than he thinks.

Science News Letter, October 23, 1943

PUBLIC HEALTH

Health Supervision Needed In Child Day Care Centers

➤ ADEQUATE HEALTH supervision, including nursing, should be provided by communities establishing day care centers for children of working mothers, warns a report issued in New York by the Council on Maternity and Child Health of the National Organization for Public Health Nursing.

Definite policies should be formulated in cooperation with the proper health authorities before the establishment of day care centers, recommends the report. Immunization against smallpox and diphtheria, medical examination of children before they are admitted, prevention and control of communicable diseases, and the care of injuries and emergency illness; all should be considered.

As not every day care center would need a full-time nurse, part-time nursing service can usually be secured.

Absenteeism of mothers from work can usually be traced to the illness of their children. Most centers do not have facilities for taking care of sick children, but volunteer or paid auxiliary workers can be trained to help with sick children in the home. Those suitable would include Red Cross-O.C.D. nurses' aides and other volunteers in public health nursing agencies, neighbors whose ability in caring for sick children is well-known or who have had a course in home nursing.

Science News Letter, October 23, 1943

PHYSICS

Revolutionary Compass Developed for Airplanes

➤ A NEW airplane compass has been developed which is not thrown off by the bomb load, armor plate or other metal parts of the plane, it was announced at the Philadelphia Division of Bendix Aviation Corporation. Motion of the plane does not affect it either.

"This new compass will not go off its reading when the plane dives or climbs rapidly, it will not lay or overshoot during a turn and it will not oscillate or 'hunt' back and forth in rough weather," the designer, W. A. Reichel, explained.

The Gyro Flux Gate Compass uses the earth's magnetic field to develop minute electrical impulses which, when amplified, turn the compass indicator. The transmitter can be located at a distance from the master indicating dial. The principle of the gyroscope is employed solely for stabilization.

This revolutionary type of compass is "as great an advance over the conventional magnetic compass as that compass was over the lodestone," Mr. Reichel said.

Science News Letter, October 23, 1943

MATHEMATICS DICTIONARY

Invaluable in reading any book that uses mathematics.

THE JAMES MATHEMATICS DICTIONARY,

the only such book now published, provides standard definitions of the terms and phrases from arithmetic through elementary differential equations; the technical terms ordinarily used in the applications of these subjects, and more advanced basic terms. Easy examples, many illustrations and all sorts of formulas are included. The appendix contains tables of weights and measures, a list of mathematical symbols and the tables ordinarily used in handbooks.

This dictionary is a great deal more than a collection of definitions. It explains, illustrates and correlates, stressing especially those operations that are hardest to understand. One reader has called it "Ten texts in one."

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MEDICINE - DENTISTRY

Post-War Dental Dream

Freedom from tooth decay in the post-war world may be possible through the use of fluorides in community drinking water supplies.

➤ EVIDENCE that one dream for the post-war world, freedom from tooth decay, is very likely to come true through use of fluorides in drinking water appeared in reports by Dr. H. Trendley Dean of the U. S. Public Health Service and Raymond J. Faust, assistant engineer of the Michigan State Department of Public Health.

"Carefully made epidemiological studies by the U. S. Public Health Service," Dr. Dean reported to the American Public Health Association meeting in New York, "show that school children using domestic waters containing as little as one part per million of fluoride experience only half to a third as much dental decay as comparable groups using a water that contains no fluoride.

"Lake Michigan, the Ohio, Mississippi and Potomac rivers are illustrations of fluoride-free waters, but of course there are many more.

"Far reaching mass control of dental decay in large population groups," he continued, "begins to loom up as a distinct possibility."

The amount of fluorine necessary to stop dental decay is not enough to cause the disfiguring mottled enamel that is found among users of water with higher fluorine concentrations. In fact, it is no more and in some cases less than the amount in water supplies now used daily by more than a million people in the United States.

Dr. Dean added one word of caution: Communities should not be hasty about adding fluorine to their water supply until careful studies show the safety of this measure in relation to other aspects of community health.

On the practical side, adding fluorine to public water supplies should not prove difficult or expensive, Mr. Faust said. It could be done with chemical feeding equipment of the type already in use and familiar to water plant operators.

The cost per person per year would be about seven-and-one-half cents. For a family of four the cost per year would be about 30 cents.

A simple, accurate color test must be developed, Mr. Faust said, so that water plant operators with little technical education could routinely check the water to make sure the right amount of fluorine was being fed into it.

Science News Letter, October 23, 1943

Tuberculosis Threat

➤ VETERANS of the last World War are a major source of new tuberculosis cases in American communities today, and the situation will become much worse after the present war if its veterans who develop tuberculosis are not better handled, Dr. Louis I. Dublin of the Metropolitan Life Insurance Company warned at the meeting.

"The control of tuberculosis among veterans is necessary if we are ever to wipe out what still remains of tuberculosis in the United States," he declared.

Even now, 25 years after the last war, about 10,000 veterans with tuberculosis are admitted and discharged each year from veterans' hospitals, he reported.

The hospitals for various reasons lack control over their patients. Veterans with tuberculosis come and go at will. As a result, their condition deteriorates and sooner or later they die of their disease. Meanwhile they have given it to many others in their homes.

This "national tragedy" may grow worse after this war, Dr. Dublin said, because the larger number of men inducted into our armed forces may greatly increase the number of tuberculosis patients among the veterans of the future.

Science News Letter, October 23, 1943

Possible Post-War Plagues

➤ YELLOW FEVER and typhus fever are the chief war plagues which may affect this nation, it appears from the report of Dr. Wilbur A. Sawyer of the Rockefeller Foundation's International Health Division at the meeting.

Risk of our returning troops bringing with them either yellow fever, typhus fever or the lice that spread the latter seems almost nil. Those going to yellow fever or typhus fever regions are vaccinated against these diseases in advance, and efficient delousing measures are taken by the armed forces.

Infected persons other than soldiers and infected mosquitoes arriving via plane, however, could readily introduce yellow fever into this country. Public Health Service quarantine measures are stringent, but insurance against yellow fever could be increased, Dr. Sawyer suggested, by increased activity of health officers in certain southern states to eradicate the yellow fever mosquitoes we already have.

Typhus also may be brought in by others than returning troops. During the last World War, typhus fever was brought in from Mexico in working men and was widely distributed. Protection against epidemics starting from such importations depends both on quarantine and on keeping communities free of lice.

Science News Letter, October 23, 1943

ENGINEERING

Safety Door Construction For Automobiles Patented

➤ AMONG the safety devices for which patents were issued recently is a vehicle safety door construction (No. 2,331,340) invented by E. H. Mosher of Merion, Pa.

The door construction is particularly for automobiles to prevent the crushing of fingers when someone slams the door. The inner edge of the door-frame, or the inner edge of the door itself, is bevelled, and the space filled with a felt or other soft material attached to the frame or door. With this arrangement the fingers may be pinched but not crushed.

Science News Letter, October 23, 1943

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MEDICINE

Growing Penicillin

Method suggested to enable doctors to use penicillin on wounds, boils, sinus infections, etc.: grow the mold on gauze dressings.

➤ A WAY to extend the benefits of penicillin to more civilians, by growing the mold in dressings for wounds, is suggested by Dr. George H. Robinson and Dr. Jas. E. Wallace, of Allegheny General Hospital in Pittsburgh. (*Science*, Oct. 8)

When penicillin, the potent germ-fighting remedy from mold, is given by injection into a vein, a concentrated and purified preparation must be used. Difficulties in large-scale production of this purified, concentrated penicillin limit its use, except in extreme cases, to the sick and wounded among our armed forces.

A crude, less concentrated product, however, can be used in treating wounds, sinus infections, boils, gonorrhea and other infections of the skin and mucous membranes, the Pittsburgh doctors believe.

Their method is to saturate gauze with a solution of yeast, sugar, starch and glycerin, to provide food for the penicillin-producing mold. This gauze is then sterilized and inoculated with the mold and used as dressing for infected wounds. The mold apparently grows and produces enough crude penicillin on the dressing to overcome the infection in certain cases.

One patient reported had had acute osteomyelitis and periostitis of the bone in his right upper arm for two weeks. Sulfa drugs had not given relief. Within three hours after the mold-inoculated gauze dressing was "planted" over the wound, there was less pain. In 10 days the patient was discharged from the hospital clinically well.

Another patient with a large furuncle on the back of his neck was treated with a similar dressing and by injection into the open crater of the furuncle of crude liquid penicillin prepared by the doctors. Within three days the patient was relieved of all discomfort and the wound was healing.

The method is now being used in treating three other patients, one with abscesses on the back and the others with osteomyelitis of the legs, and the patients are getting well.

Science News Letter, October 23, 1943

NUTRITION

Cheese Ripening Periods May be Shortened

➤ SPEEDING up the process of ripening cheese is a war measure: food is fuel for fighting men; its production must not be too little or too late. The period required for curing American cheddar cheese from pasteurized milk may be much shortened as a result of studies made in the laboratories of the University of Wisconsin.

Cheese ripening results from the work of enzymes, complex organic substances which cause transformations in other compounds. One particular group of enzymes active in cheese curing are known as lipases. They break down the butterfat into lower fatty acids and cause other changes. Proteinases soften the curd by "digesting" proteins.

Trials show the lipase content of cheese gradually increases as the cheese ages, but more rapidly in raw cheese than in pasteurized-milk cheese. There is no increase of proteinase during the making of cheese from pasteurized milk.

The study brings out much information on the action of enzymes in cheese ripening. The conclusion of Merlin Peterson and Marvin Johnson, who conducted the investigations, is that speed-up in ripening will probably result from adding enzyme-producing organisms to the culture used as a starter in cheese making. Continued investigations will be made to check this conclusion.

Science News Letter, October 23, 1943

PUBLIC HEALTH

Millions Have Health And Hospital Insurance

➤ HEALTH INSURANCE in the United States has reached the point where hospital insurance now covers 13,000,000 on a Blue Cross plan and is operating in 36 of the 48 states, Dr. Nathan Sinai, of the University of Michigan School of Public Health, reported at the conference of the American Public Health Association in New York.

About 4,000,000 more are covered by commercial plans for hospital insurance. Some 800,000 have insurance for medical care under plans sponsored by medical societies in 12 states and there are hundreds of industrial plans covering all varieties of health insurance.

"The prepayment plans now in existence," Dr. Sinai said, "have learned that their whole administration is as good or as bad as their local administration, a fact that public health learned many years ago."

Science News Letter, October 23, 1943

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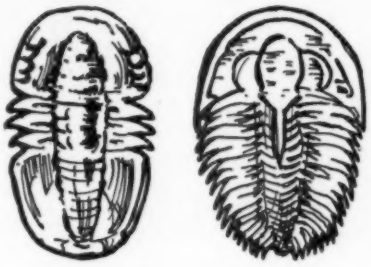
PALEONTOLOGY

NATURE RAMBLINGS

by Frank Thone



Multiform Fossils

➤ FOSSILS can be formed in a considerable variety of ways. Broadly speaking, fossils are the relics or remains of ancient animals and plants, no matter how they were formed or how preserved. There are many types of fossils, including among others: petrifactions, impressions, casts, natural mummies.

True petrifactions are fairly common, although they are confined largely to one class of material: petrified wood. This seems to have been formed under rather peculiar circumstances: quick burial, as by fine volcanic ash, followed by very slow decay, with replacement of the decaying wood, molecule by molecule, with hard mineral (usually some form of silica) out of ground water, which was probably hot. These siliceous petrifactions are often beautifully detailed, displaying the minutest details of structure if they are ground thin and polished and examined under a microscope.

Impressions are made when some object like a leaf or an insect, falls upon soft mud or silt and is subsequently pressed flat and covered by another layer of the same material, and the whole is then deeply buried and slowly changed to stone. The fossil of the first known bird, Archaeopteryx, one of the most famous fossils in the world, is an impression, made when one of these strange, half-reptilian creatures fell into a limy silt bed in Germany, many millenia ago. So fine was the grain of the silt that even the barbs of the feathers are faithfully outlined on the slab of lithographic stone.

Akin to impressions, but sculptured in the round as it were, we have casts. These are formed when the process of decay is more rapid, leaving a hollow space, which is filled in with fine mud or silt. The process is very much like the making of plaster-cast sculptures. The great majority of bone fossils are casts, as are also most of the strangely marked tree trunks found in the clay-stone deposits associated with coal beds.

Natural mummies are the actual bodies of the dead animals, preserved by drying, like the ground sloths found in our Southwestern desert caves, or by freezing in permanently frozen ground, like the mammoths dug up in Siberia. One of the most unique of such specimens is an Ice Age rhinoceros found some years ago in a bed of oil-impregnated clay in Poland. The giant beast was literally pickled in oil, like a sardine!

Science News Letter, October 23, 1943

PHOTOGRAPHY

Photographic Dyes

New use of dyes gives science photographic plates that are sensitive to wide range of visible and invisible light.

➤ PHOTOGRAPHIC PLATES that capture any kind of light from the ultraviolet to the farthest reaches of the infrared are now available for scientific use through the use of sensitizing dyes, Dr. C. E. K. Mees, research director of the Eastman Kodak Company, told the American Academy of Arts and Sciences in Boston in accepting that Society's highest award, the Rumford Medals, in recognition of his photographic researches.

"A great variety of photographic plates have been made for the spectroscopist and the astronomer," Dr. Mees reported, "who have made discoveries of considerable importance.

"While the eye is sensitive to the visible spectrum," Dr. Mees explained, "and the brightest colors to the eye are yellow, green and red, photographic materials are in their nature sensitive only to the blue-violet and ultraviolet regions of the spectrum, to which the eye has little or no sensitiveness."

Vogel discovered in 1873 that the addition of dyes to photographic materials would make them sensitive for the region of the spectrum absorbed by the dye. This proved to be the foundation of the change in photography effected by the introduction of orthochromatic and panchromatic materials. In 1904 a series of dyes were made in Germany which sensitized plates for those regions of the spectrum which are bright to the eye. The first commercial panchromatic plates were made in England in 1906 by Wratten and Wainwright, Ltd., of which Dr. Mees was then managing director.

The dyes were derived from quinoline, Dr. Mees explained, but their general structure remained unknown until 1920. It became possible to prepare a great variety of these cyanine dyes, as they are called, many of which were superior for photographic use to those which had previously been available.

By the use of them, supersensitive panchromatic materials were made, and these have effected a great advance in photography, especially in motion pictures. The new dyes made possible fine grain panchromatic film of high speed used in miniature cameras. By the use of the cyanine dyes with especially long chains of carbon atoms, photography by infra-red light has been greatly facilitated.

Science News Letter, October 23, 1943

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New Machines and Gadgets

⚙ *GAUGES for automobiles which will register directly the miles-per-gallon performance of cars may soon be available. One has been patented which works in connection with the fuel pump.*

Science News Letter, October 23, 1943

⚙ *FLAT LUNCH BOXES with rounded ends have five compartments for hot and cold, solid and liquid foods, topped with paper lids which can be discarded after use. When the seal-lock cover to the box is closed, food temperatures are held for hours.*

Science News Letter, October 23, 1943

⚙ *TRANSPARENT plastic V-shaped covers for laboratory water baths are replacing copper covers. Condensed moisture collected on them runs down the sides back into the water instead of dropping into the test tubes in the bath.*

Science News Letter, October 23, 1943

⚙ *AMOUNT of strategic copper needed to make printing plates is reduced by a third through addition of a new chemical to the electroplating solution. The chemical increases the hardness of the copper deposit so that a thinner layer gives equal service.*

Science News Letter, October 23, 1943

⚙ *IMPROVED SUPERCHARGERS enable warplanes to rise rapidly in high altitudes. Superchargers force more air, or air and fuel, into engine cylinders than would be induced normally under the low pressure. The picture shows a supercharger impeller being secured on the left end of its shaft; the turbine at the right will be operated by exhaust gases from the engine.*

Science News Letter, October 23, 1943

⚙ *METHYL ACRYLATE, chemical ingredient of plastics and synthetic rubber, can now be obtained by an improved method from lactic acid. The parent acid, in turn, comes from fermentation of such farm products as molasses, starch and milk whey. Methyl acrylate has heretofore been produced synthetically. Commercial manufacturers are experimenting with the new lactic-acid method on a pilot-plant scale.*

Science News Letter, October 23, 1943

⚙ *TRANSPARENT PLASTIC bags protect warplane fuselages during shipment overseas. A single large plastic sheet is wrapped around the fuselage and sealed. When air inside is pumped out, the bag collapses and forms a tight-fitting coat. Moisture inside is absorbed by enclosed bags of silica gel.*

Science News Letter, October 23, 1943

⚙ *SMALL DRILL PRESSES can be made to perform jobs that otherwise would require more complicated machinery by use of a special electric drive which has a wide range of speeds controlled by a push-button station.*

Science News Letter, October 23, 1943

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 179.*

Just Off the Press

AS THE CHILD GROWS—Helen B. Pryor,—*Silver Burdett,* illus., 400 p., $3.

BROWN AMERICANS: The Story of a Tenth of the Nation—E. R. Embree—*Viking,* 248 p., $2.75. A discussion of the Negro's share in the life of America by the president of the Julius Rosenwald Fund.

CONCRETE HANDBOOK: Everything you need to know to make use of this universal building material—*Pop. Mech. Press.* illus., 96 p., $1.50.

CONTEMPORARY PSYCHOPATHOLOGY: A Source Book—S. Tomkins, ed.—*Harvard Univ.,* 600 p., illus., $5.

DUNE BOY: The Early Years of a Naturalist—E. W. Teale—*Dodd, Mead,* illus., 254 p., $3.

EMERGENT MIND AND EDUCATION: A Study of George H. Mead's Bio-social Behaviorism From An Educational Point Of View —A. S. Clayton—*Columbia Univ.,* 179 p., $2.35.

GENES AND THE MAN—Bentley Glass—*Columbia Univ.,* 386 p., illus., $3.50. Facts and principles that aid in understanding the nature of growth, development and aging.

A HUNDRED YEARS OF MEDICINE—C. D. Haagensen, W. E. B. Lloyd—*Sheridan,* illus., 444 p., $3.75.

OUT OF THIS NETTLE, DANGER—H. W. Dodds—*Princeton,* 57 p., $1.

PAINTING, FURNITURE FINISHING AND REPAIRING: A compilation of helpful articles for Craftsmen, Home Owners, Painters and Handymen—*Pop. Mech. Press,* illus., 96 p., $1.50.

PRINCIPLES OF PHYSICAL METALLURGY—Frederick L. Coonan—*Harper,* 238 p., illus., $3.25.

RADIOGRAPHIC INSPECTION OF METALS—Otto Zmeskal—*Harper,* 150 p., illus., $2.75.

TAXIDERMY—L. L. Pray—*Macmillan,* illus., 91 p., $1.49. The book is a good manual for the amateur and the hunter or fisherman who desires to preserve trophies and specimens taken in the field.

THE WARTIME COOK BOOK—Alice Bradley —*World Pub.,* 128 p., 49c.

WEBSTER'S BIOGRAPHICAL DICTIONARY—W. A. Neilson, ed.—*Merriam,* 1697 p., $6.50. A dictionary of names of noteworthy persons with pronunciations and concise biographies.

WHAT TO MAKE AND HOW TO MAKE IT: Including Homemade Furniture, Ways to Improve Your Home and Garden, Craftwork, Photographic Equipment, Gifts, Toys, etc.—*Pop. Mech. Press,* illus. 217 p., 50c., vol. 5, 1944 paper ed. only.

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